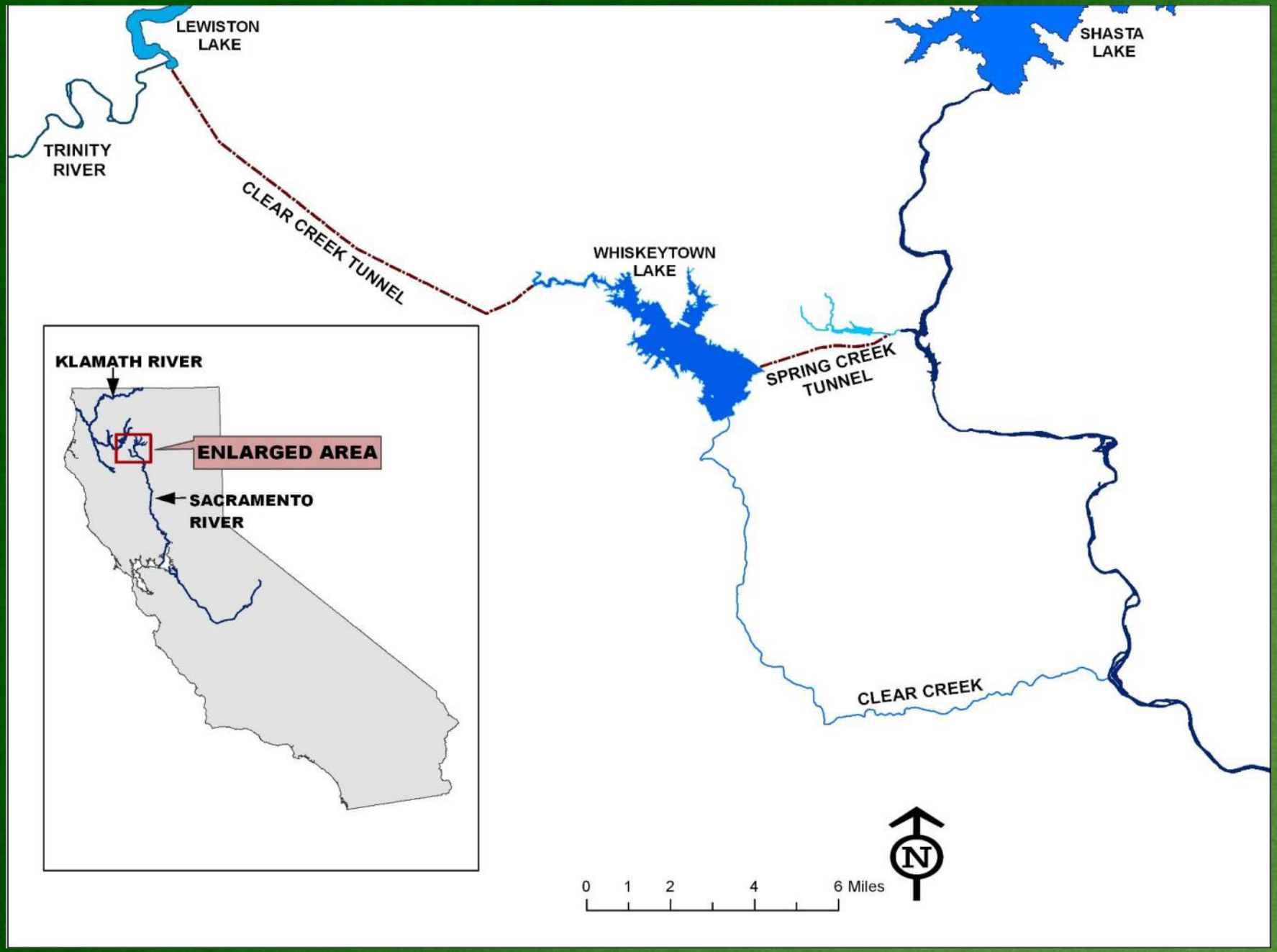
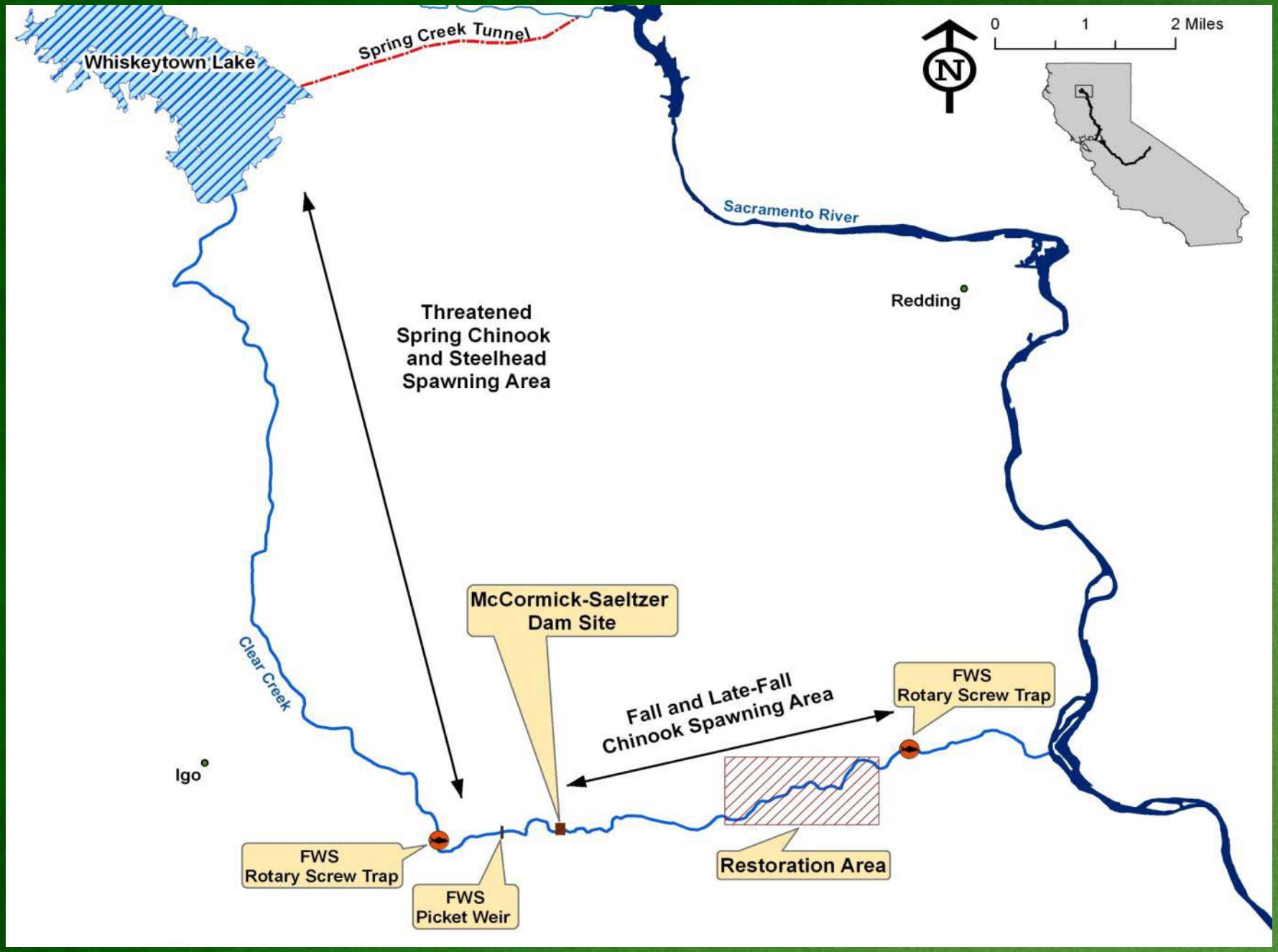
Clear Creek Technical Team Annual OCAP BO Review

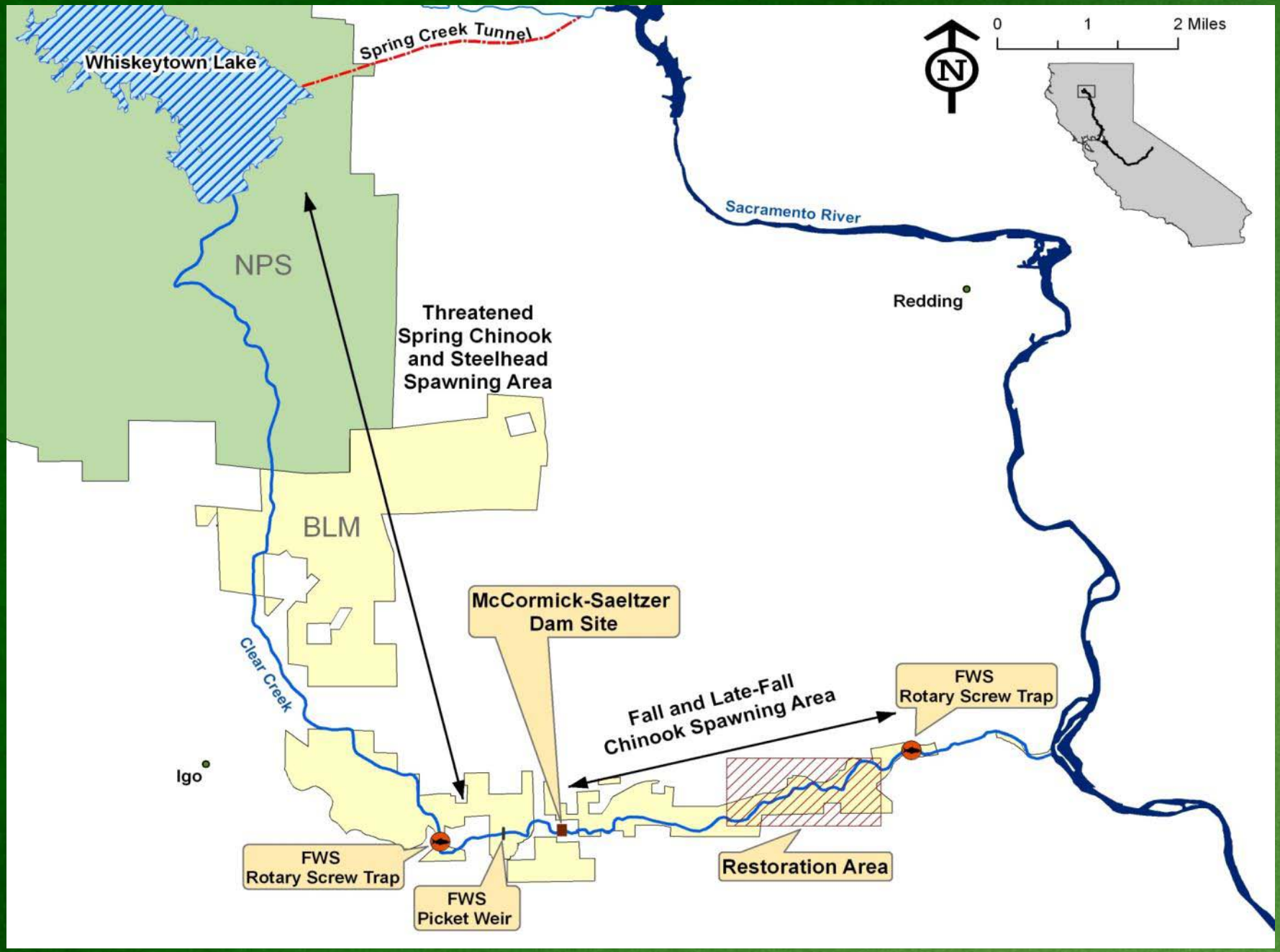
Matt Brown
U.S. Fish and Wildlife Service
November 8, 2010

Outline

- Overview / Background
- RPA Required Monitoring and Reporting
- Review of Specific Actions
  - Spring Attraction Flows
  - Channel Maintenance Flows
  - Spawning Gravel Addition
  - Replace Temperature Curtain
  - Thermal Stress Reduction
  - Adaptively Manage Flows Based on New IFIM


LEWISTON LAKE
SHASTA LAKE
TRINITY RIVER
CLEAR CREEK TUNNEL
WHISKEYTOWN LAKE
SPRING CREEK TUNNEL
KLAMATH RIVER
ENLARGED AREA
SACRAMENTO RIVER
CLEAR CREEK
N
0 1 2 4 6 Miles


Whiskeytown Lake
Spring Creek Tunnel
Sacramento River
Redding
Threatened
Spring Chinook
and Steelhead
Spawning Area
McCormick-Saeltzer
Dam Site
Clear Creek
Igo
Fall and Late-Fall
Chinook Spawning Area
FWS
Rotary Screw Trap
FWS
Rotary Screw Trap
FWS
Picket Weir
Restoration Area
N
0
1
2 Miles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N
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Alphabet Soup of Cooperators and Stakeholders

- BOR, FWS, BLM, NPS, NOAA, NRCS
- DFG, DWR, DOC, RWQCB, CDF
- Western Shasta RCD
- Shasta County, Redding Rancheria
- UC Davis and Berkeley, CSU Chico and Sacramento, Dept of Education
- Bioregional Council, Horsetown-Clear Creek Preserve, CC CRMP
- CVWUA, SMUD, NCPA, CCCSD, COR

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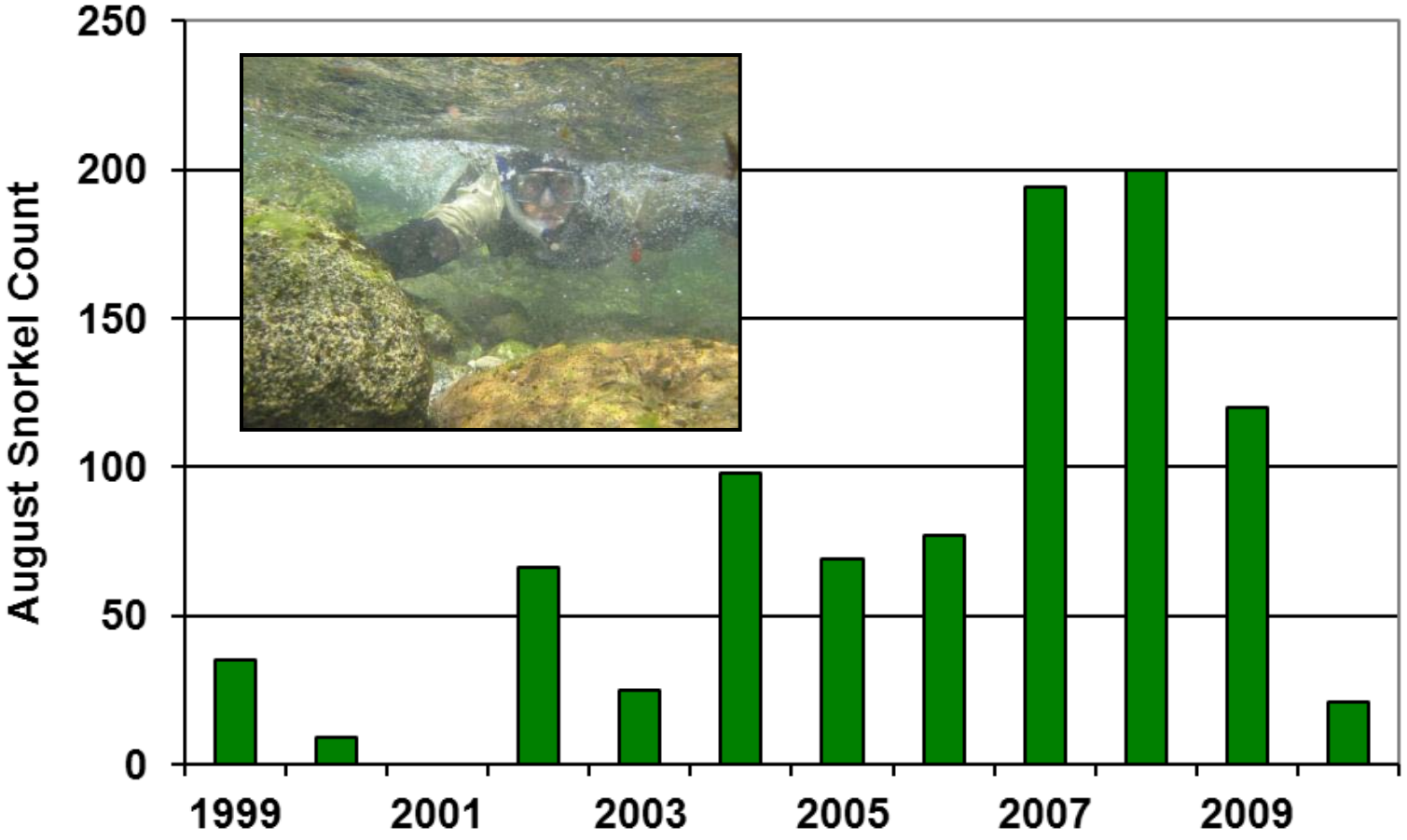
RPA Required Monitoring and Reporting

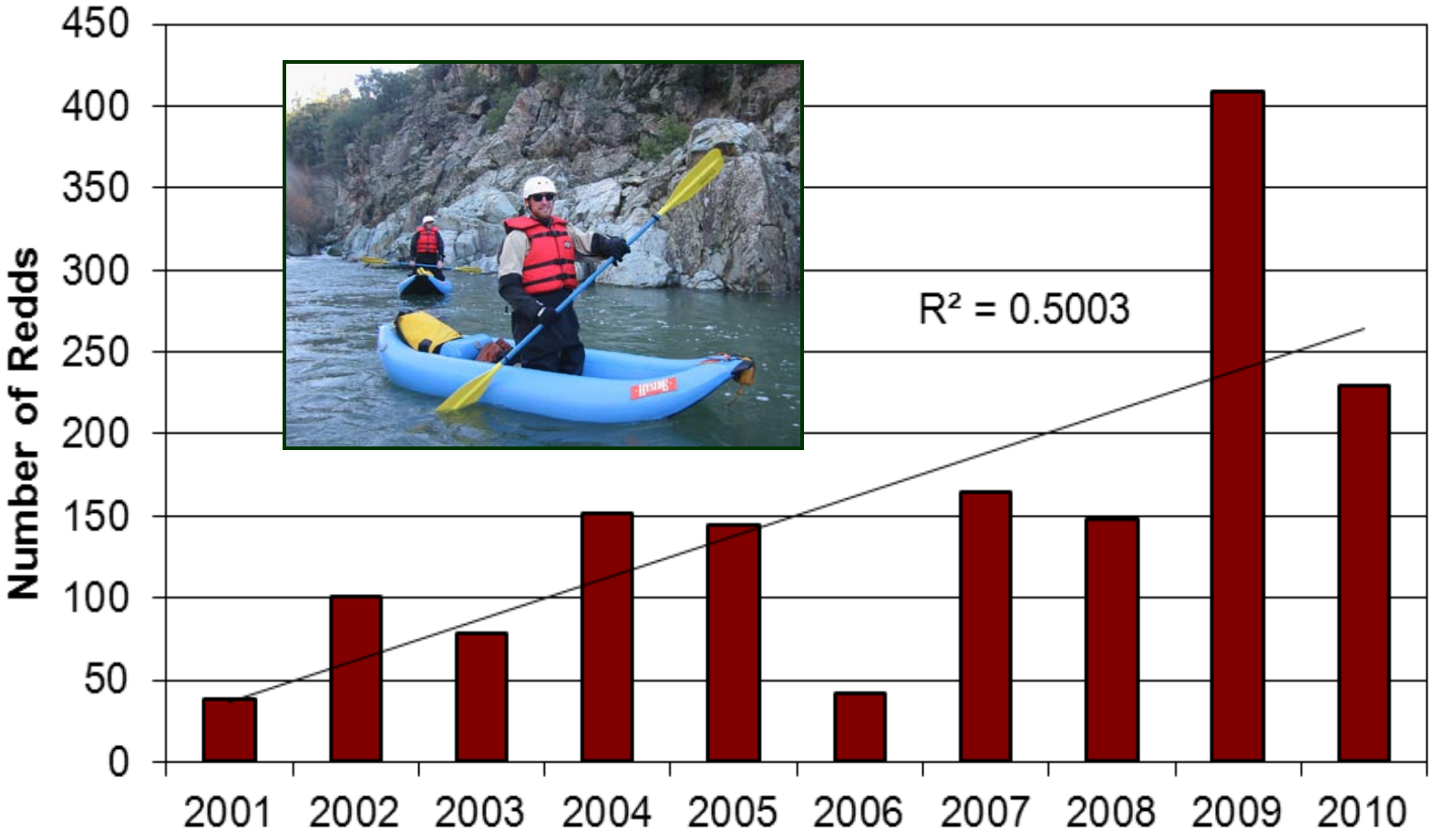
- Fall / spring Chinook segregation weir
- Spring Chinook snorkel survey
- Steelhead redd survey
- Juvenile steelhead trapping

- Juvenile spring Chinook trapping

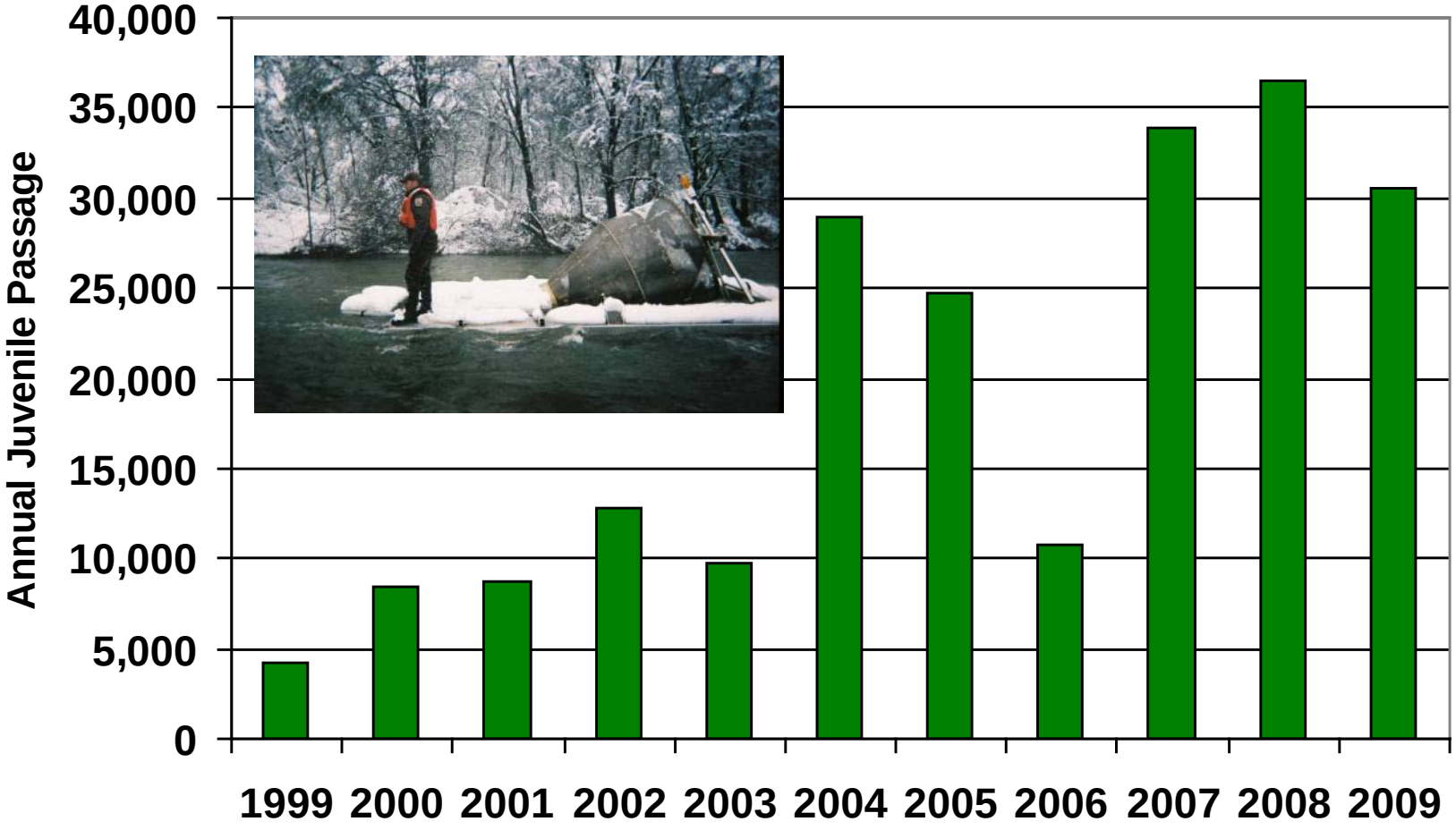
Spring Chinook Cohorts Were Increasing



Steelhead Redd Index



Steelhead Juvenile Passage Increasing



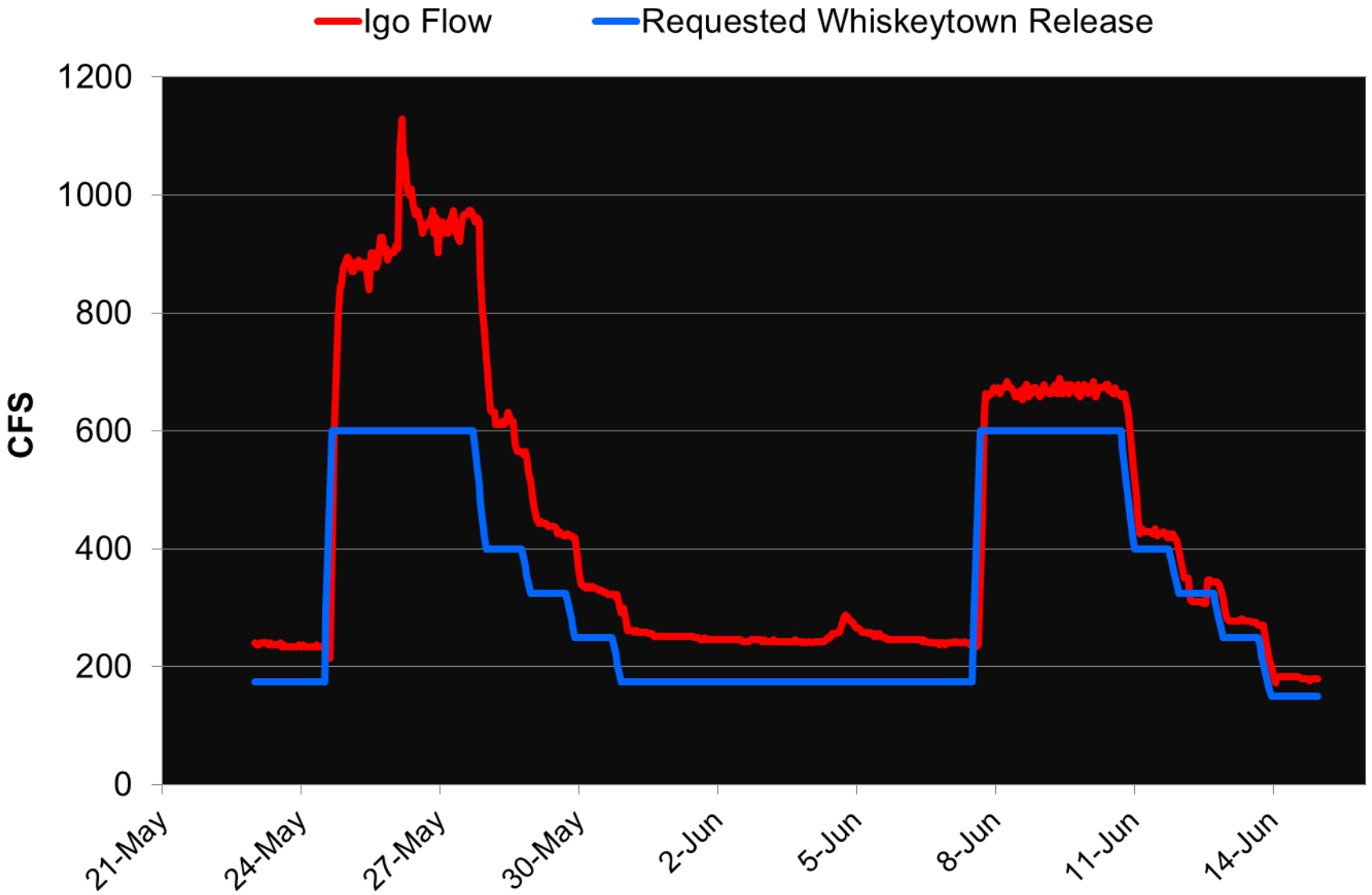
Progress Towards:

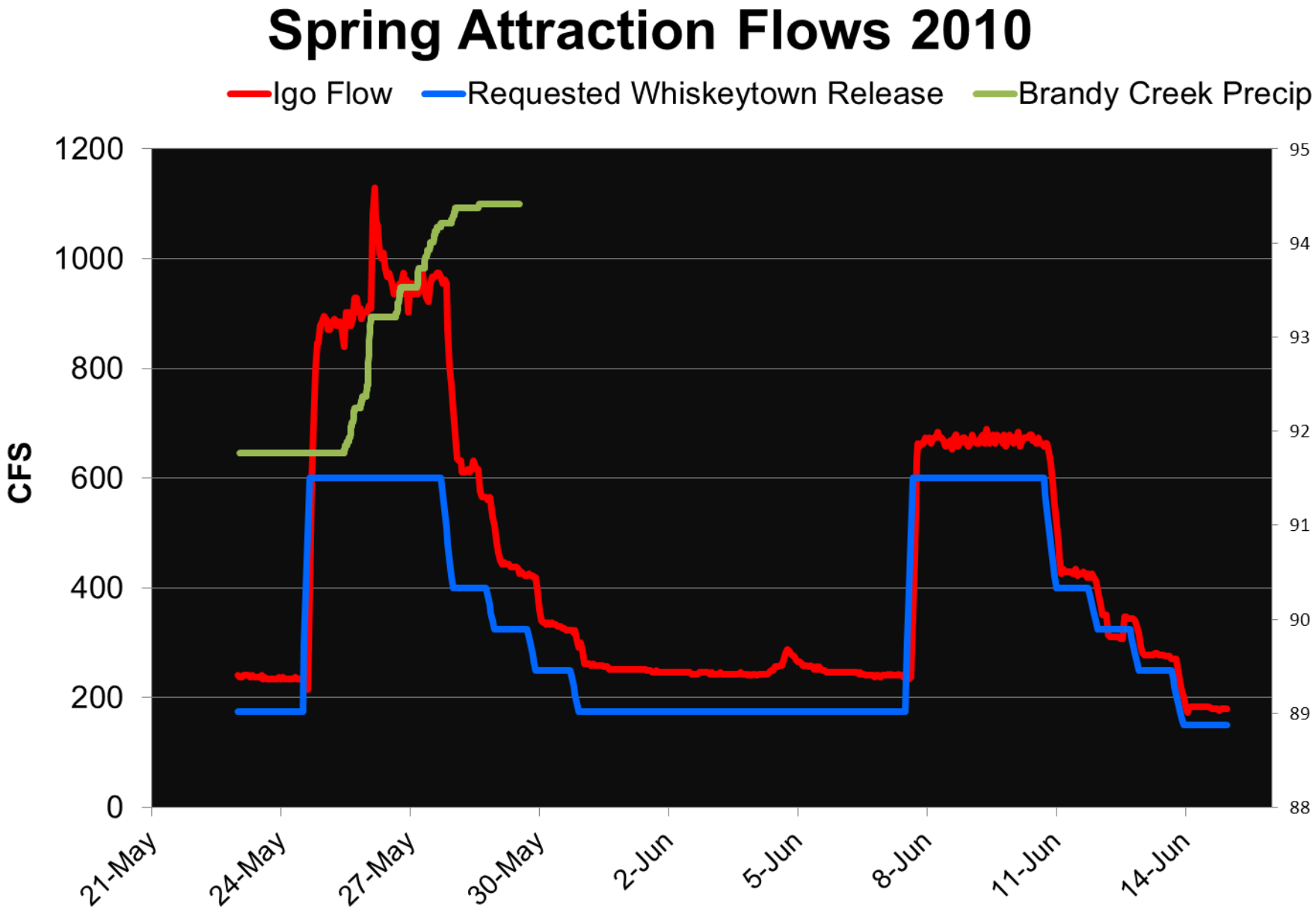
- Spring Attraction Flows — Yes
- Channel Maintenance Flows — No
- Spawning Gravel Addition — Yes
- Replace Temperature Curtain — Yes
- Thermal Stress Reduction — Yes / No
- Adaptively Manage to Habitat Suitability / IFIM Study Results — Yes

Spring Attraction Flows

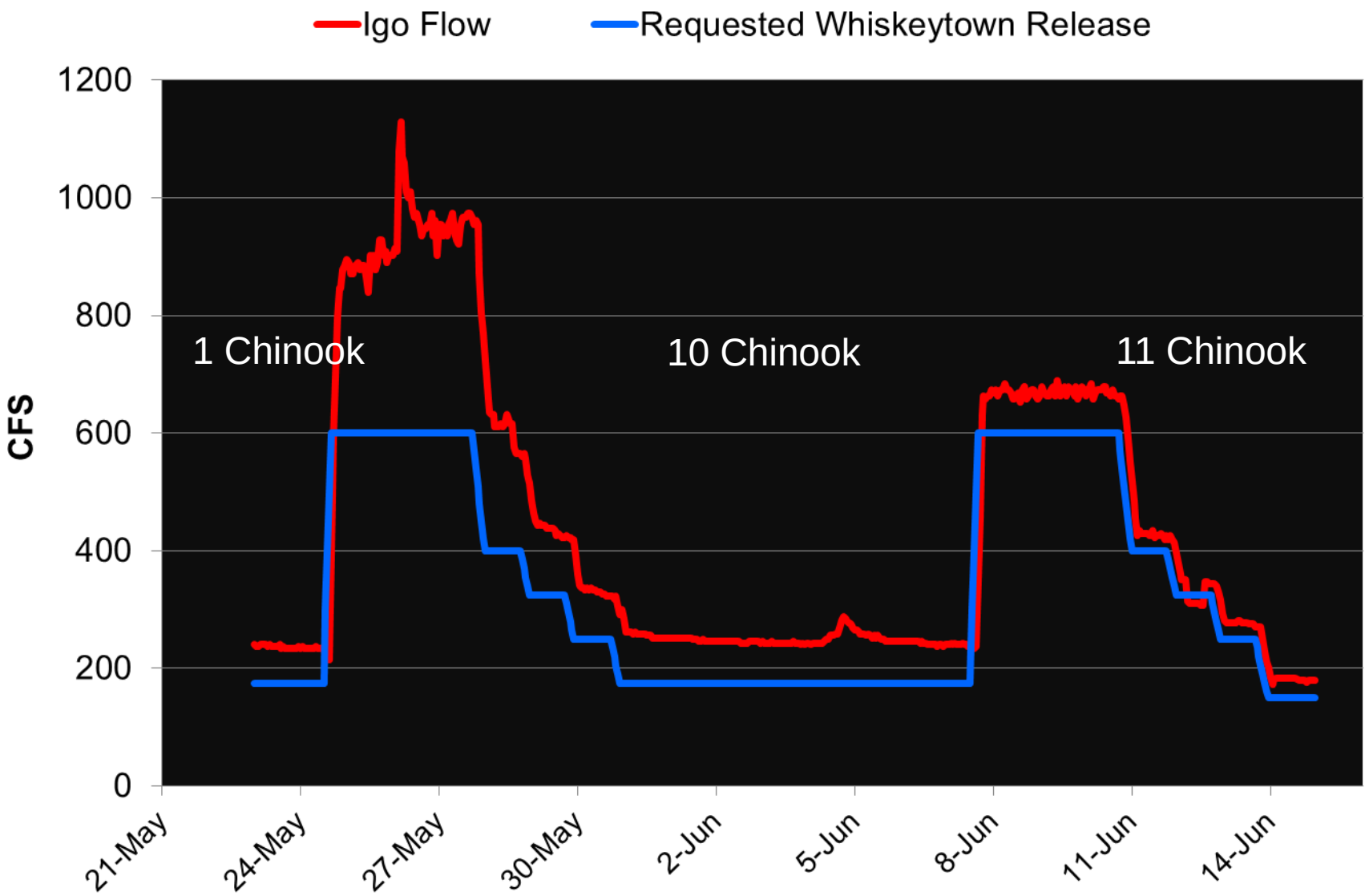
- **Objective:** Encourage spring-run movement upstream for spawning.
- **Action: A**nnually conduct two pulse flows in May and June of at least 600 cfs for at least three days for each pulse.
- **Results:** Two pulse flows were provided between May 24 and June 14, 2010.
- **Results:** Fish distribution inconclusive.

Spring Attraction Flows 2010




Spring Attraction Flows 2010
Igo Flow
Requested Whiskeytown Release
Brandy Creek Precip
CFS
1200
1000
800
600
400
200
0
95
94
93
92
91
90
89
88
21-May
24-May
27-May
30-May
2-Jun
5-Jun
8-Jun
11-Jun
14-Jun

Spring Attraction Flows 2010



Spring Attraction Flows

- **Recommendations:**

- Continue providing attraction flows similar in magnitude and duration to 2010.

- Experiment with higher flows that still allow water district to receive water.

Channel Maintenance Flows
No Progress Since 2008

- **Action:** Re-operate Whiskeytown during the winter and spring to produce channel maintenance flows.

- **Results:** In 2008, CALFED ERP contracted FWS to plan and implement a one-time re-operation after Reclamation completed risk analysis.

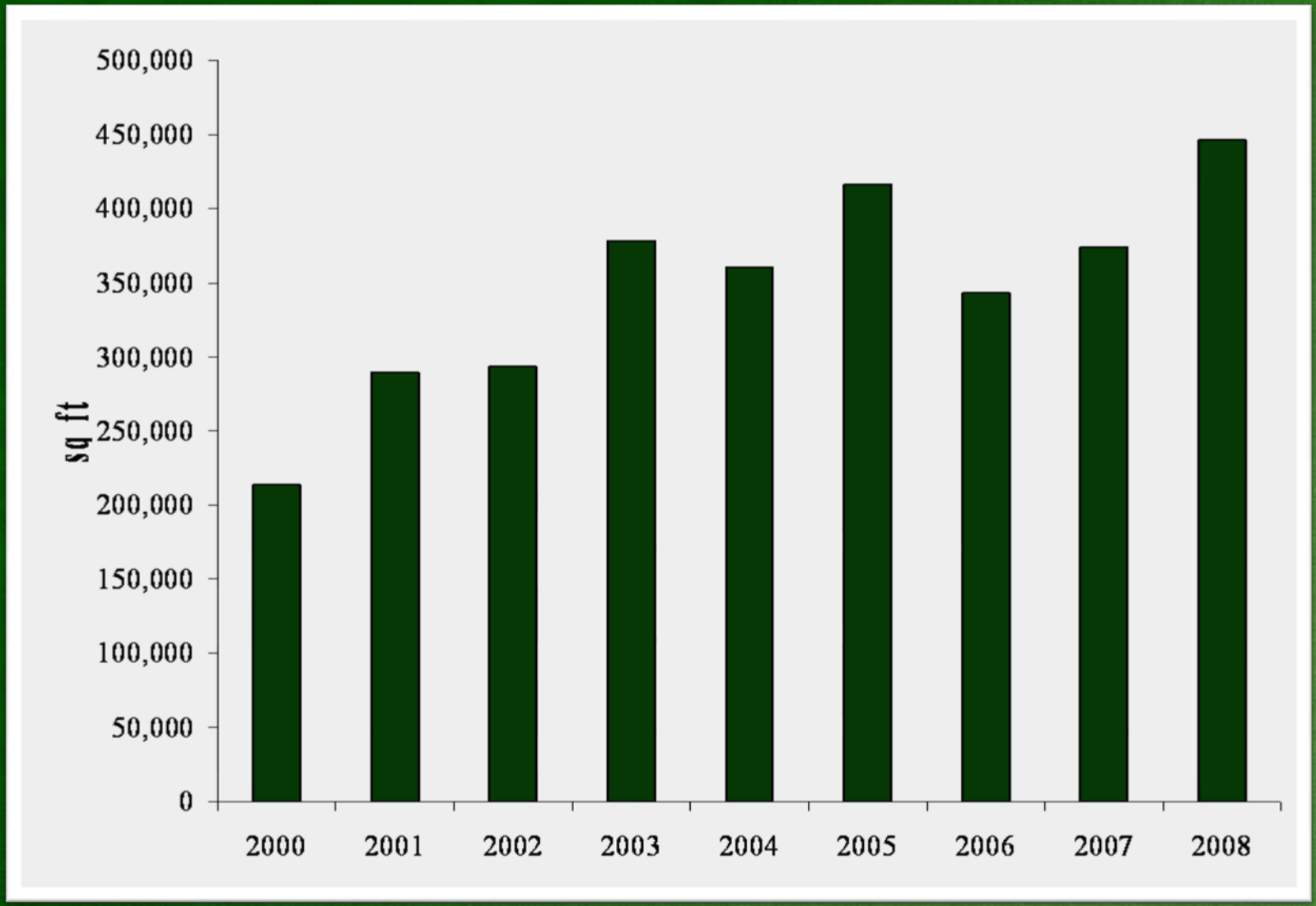
Channel Maintenance Flows

- **Recommendation:** Reclamation and other agencies should continue discussions for possible implementation.

Spawning Gravel Additions Yes

- Actions: Continue spawning gravel augmentation and provide report to NMFS on Implementation and Effectiveness.
- Results:
  - 13 Projects totaling 14,060 tons
  - Long-term permits
  - Long-term gravel supply
  - Report summarized fisheries monitoring related to effectiveness.

Spawning Area Increasing



Monitoring To Evaluate RPA Action I.1.3. Gravel Addition

- Spawning area / redd mapping
- Macro-invertebrates
- Topography, longitudinal profile, and facies mapping
- Sediment transport
- Sediment size

Gravel Recommendations:

- Continue to add gravel at existing sites.
- Develop new sites.
- Provide controlled pulse flows from Whiskeytown to move supplemental gravel into the creek and create spawning habitat.

Replace Temperature Curtain
Yes

- **Objective:** Reduce water temperatures for listed salmonids in the Sacramento River.
- **Action:** Replace the Spring Creek Temperature Control Curtain in Whiskeytown Lake by 2011.
- **Results:** Contract awarded September 10, 2010. New curtain installation will begin spring 2011 with estimated completion by June 30, 2011.

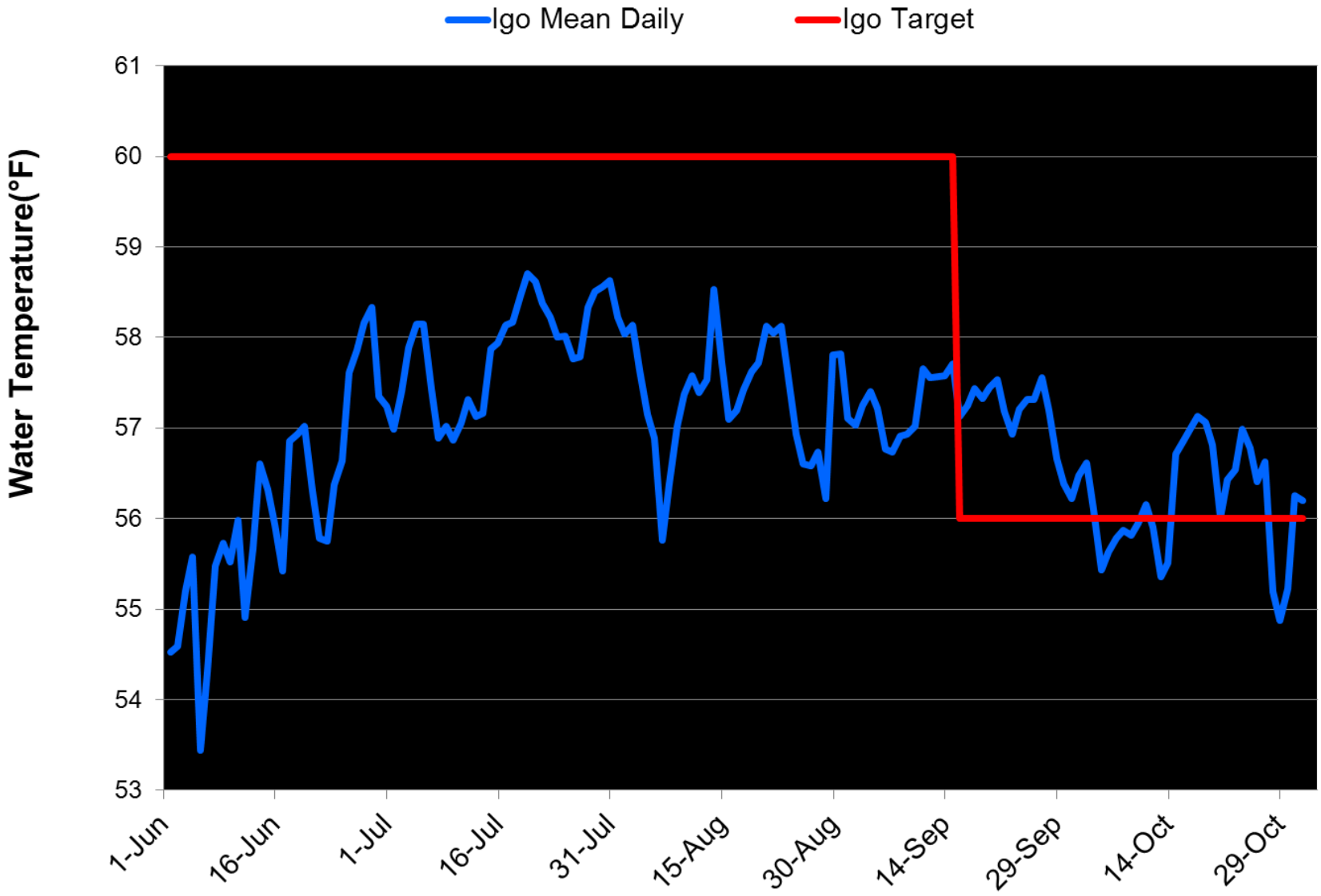
Thermal Stress Reduction
Yes / No

- **Objective:** Reduce thermal stress to over-summering steelhead and spring-run
- **Action:** meet daily water temperatures:
  - 60°F at the Igo gage from June 1 through September 15; and
  - 56°F at the Igo gage from September 15 to October 31.
- **Action:** Assess improvements to modeling water temperatures and identify a schedule for making improvements.

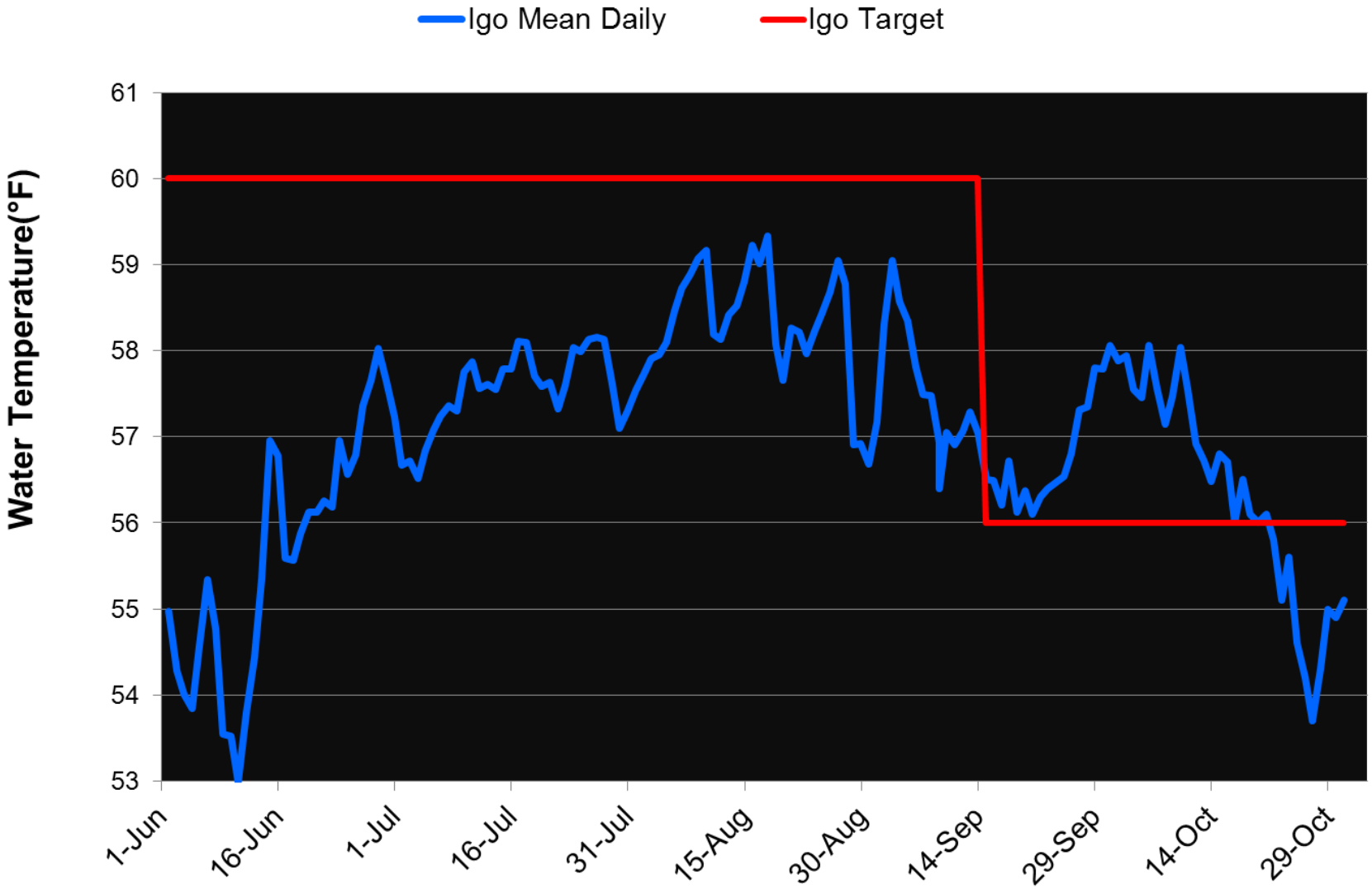
Percent of Time Achieving Igo Temperature Criteria

	Holding	Spawning
Period	June 1 to Sept 14	Sept 15 to Oct 31
Target	60° F	56° F
Average 2001 to 2008	99%	93%
2009	100%	**28%**
2010	100%	**26%**

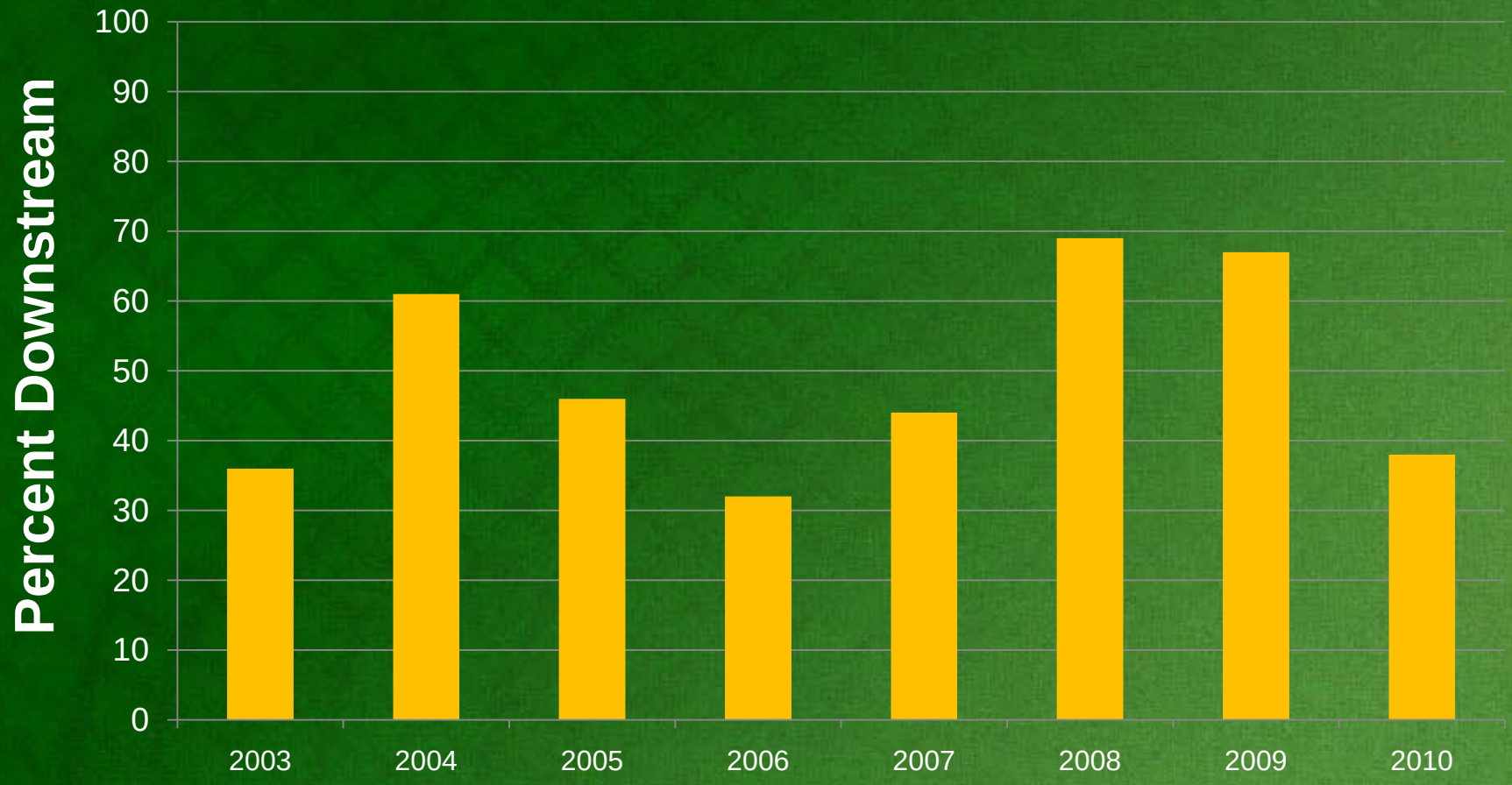
Igo Water Temperatures 2009



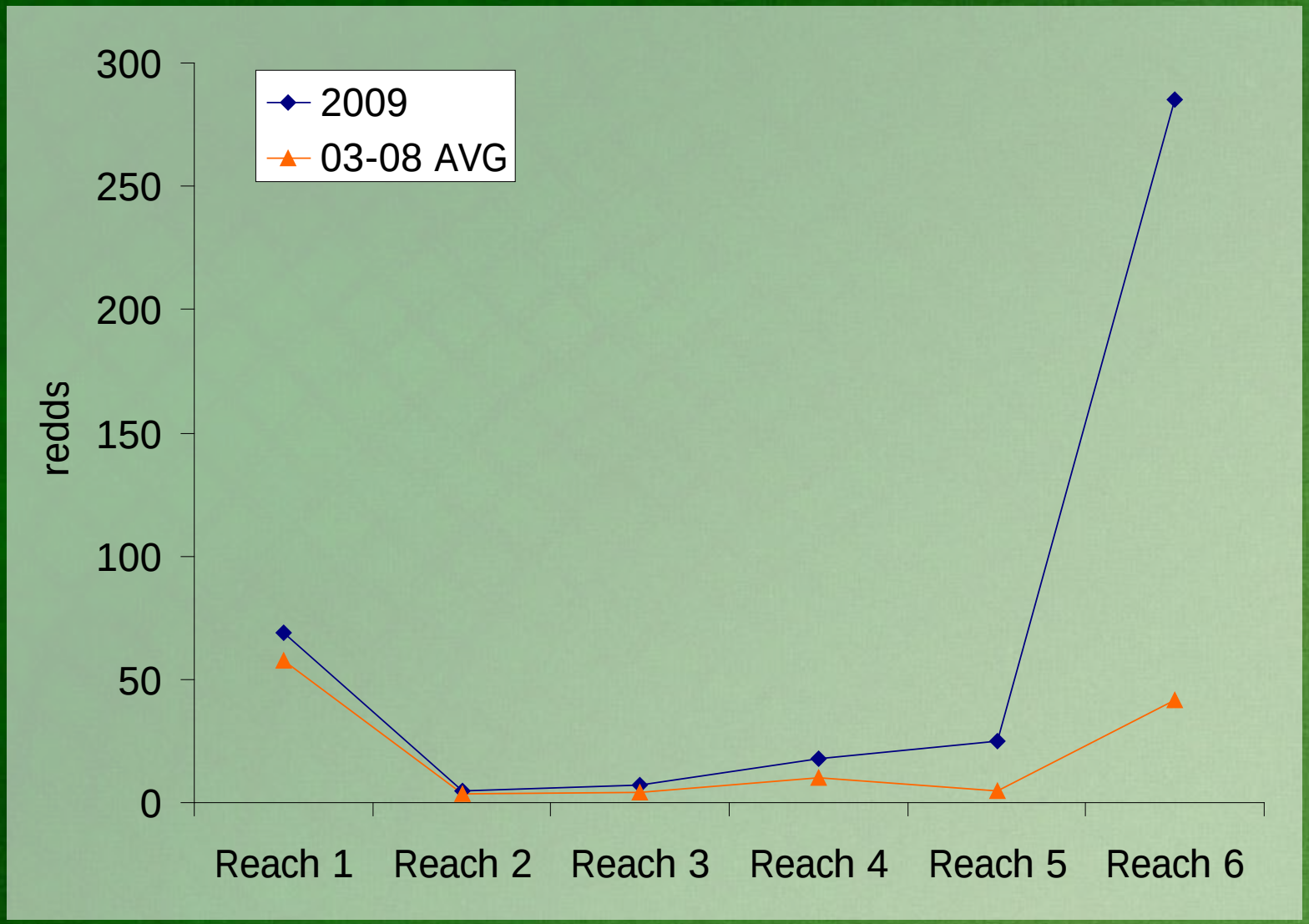
Igo Water Temperatures 2010



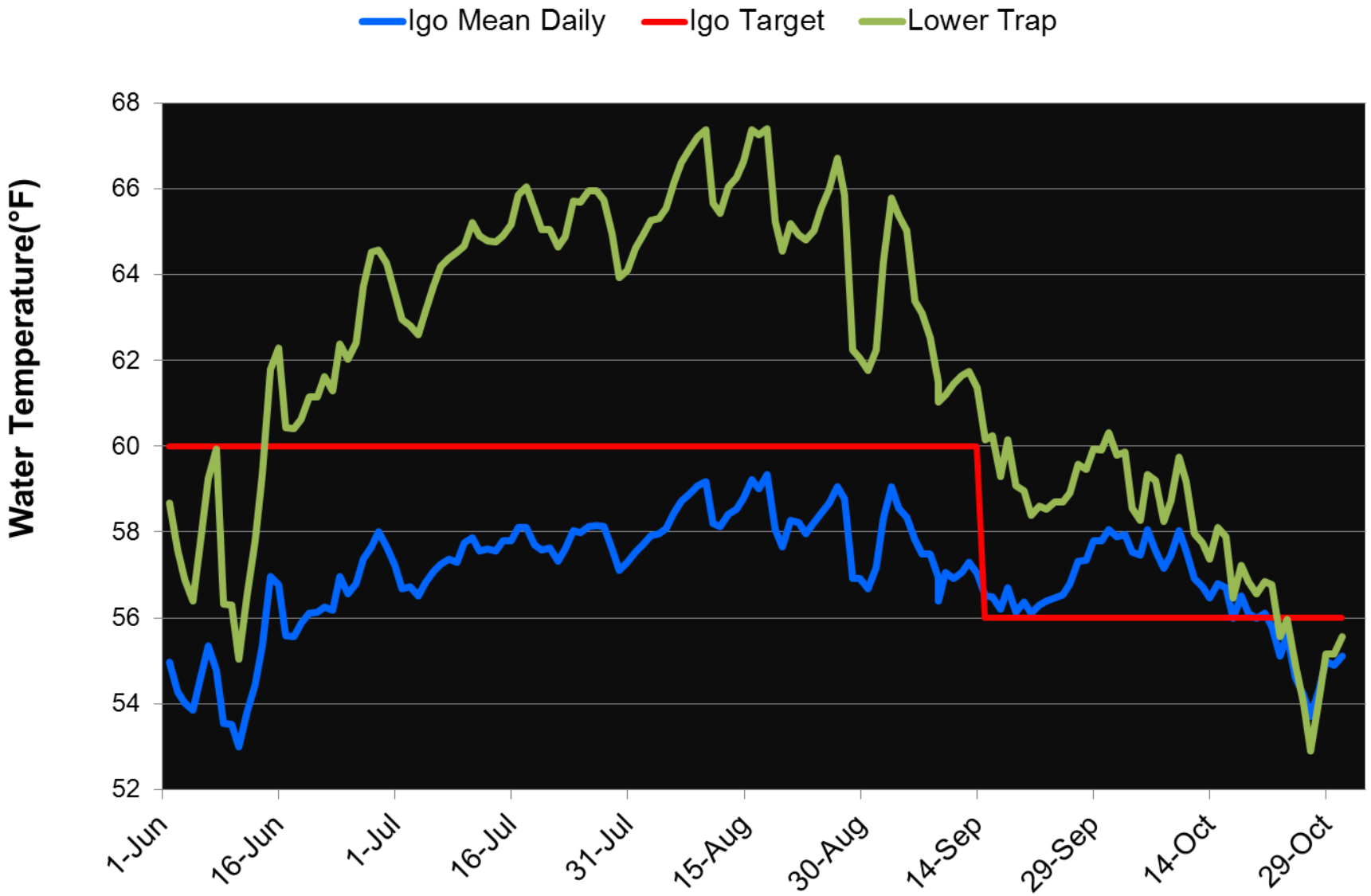
Percent of Spring Chinook Holding Downstream of Igo



Steelhead Redd Distribution



Igo and RST Water Temperatures 2010



Thermal Stress Reduction Recommendations:

- Work to maximize success of meeting Igo temperature criteria annually.
- Coordinate with other agencies to discuss options to avoid negative impacts to temperature control.
- “Reclamation, in coordination with NMFS, will assess improvements to modeling water temperatures in Clear Creek and identify a schedule for making improvements.”

Adaptively Manage to Habitat Suitability / IFIM Study Results Yes

- **Objective:** Improve flow management through state-of-the-art scientific analysis of habitat suitability.
- **Action**: Continue to operate Whiskeytown Reservoir until habitat suitability studies (*e.g.,* IFIM) are complete.
- **Action**: Propose flows to reduce adverse impacts on spring-run and steelhead

Summary of Recommendations:

- Experiment with higher spring attraction flows that still allow water district to receive water.
- Reclamation and other agencies should continue discussions for possible channel maintenance flows.
- Provide controlled pulse flows from Whiskeytown dam to move gravel into the creek and create spawning habitat.
- Assess improvements to modeling water temperatures in Clear Creek and identify a schedule for making improvements.


Thank You
Any Questions?

Whiskeytown Summer Outflow Water Temperatures 2006-2010